ECO 401-002, 003
Problem Set #7
Spring 2013

Due: Wednesday, April 17, 2013.

4 pts

1. Why will a monopolist like Disney World never set its admission price at a level such that demand is price-inelastic? Sketch demand and total revenue curves such as those depicted in Figure 11.6 to explain your answer.

4 pts

2. Levi's studies the demand for the re-release of its Original 501 button-fly jeans, and decides to set a price, $39.99, that is twice as high as the marginal cost of supplying a pair of those jeans. What does Levi's think that own-price elasticity of demand for its 501 jeans is? (Hint: use the inverse elasticity rule.)

6 pts

3. The (inverse) demand curve for a new drug is $P = 100 - 2Q$. The monopoly supplier that holds the patent for this drug has constant marginal and average costs of $20 per dose.
   a) What is the monopolist's profit-maximizing output and price? What are its profits? Illustrate in a diagram.
   b) What is the deadweight loss relative to the outcome that would occur if the drug were competitively supplied? Illustrate in your diagram.
   c) Can you think of a reason why society might want to grant a monopoly to someone who invents a new drug?

4 pts

4. Suppose that as part of a new health-care plan the government levies a $5 per dose on the monopolist above. What would happen to the monopolist's profit-maximizing price and output, and its profits? What would happen to the deadweight loss? Illustrate all of this in a new diagram.

18 pts. total

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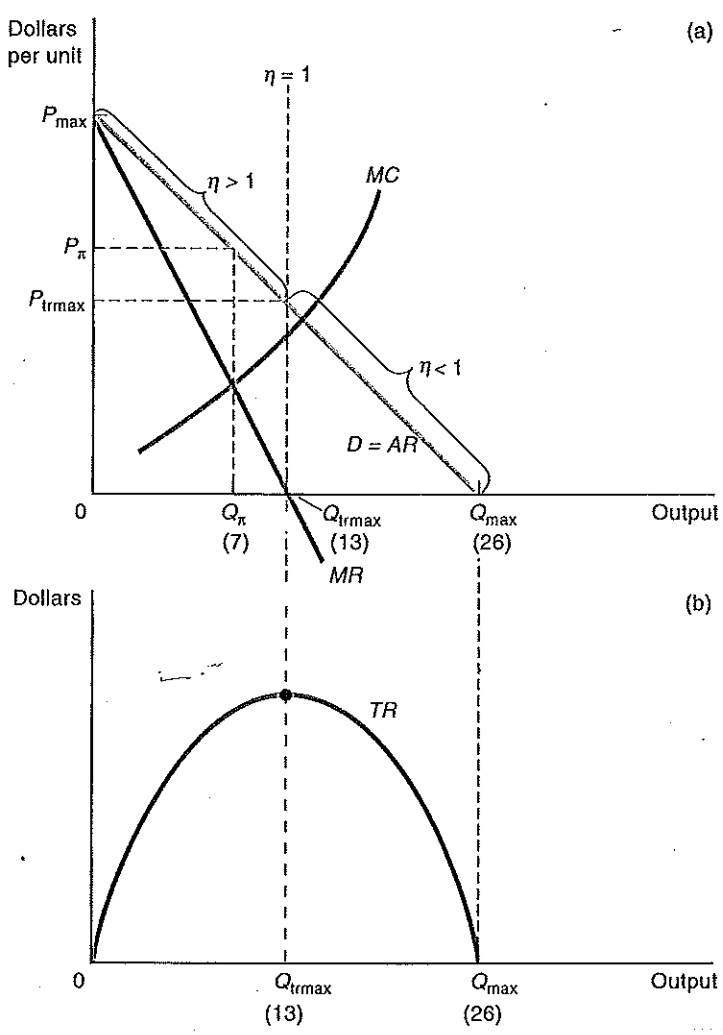
1. If demand is inelastic at the chosen price and output combination, then profit will increase if the monopolist raises price and reduces output. Total revenue will increase when price is raised and demand is inelastic. Total cost will fall when output is reduced. Profit necessarily will increase. See below:



2. Inverse-elasticity rule – monopolist will maximize profit by setting price such that $\frac{P - MC}{P} = \frac{1}{n}$

where n is own-price elasticity of demand.

if $P = \$40$ and $MC = \$20$, then

$$\frac{40 - 20}{40} = \frac{1}{n}$$

$\frac{1}{2} = \frac{1}{n}$, so $n = 2$

3. (a) $P = 100 - 2Q$, $MC = \$20$

$TR = P \cdot Q = 100Q - 2Q^2$

$MR = \frac{dTR}{dQ} = 100 - 4Q$

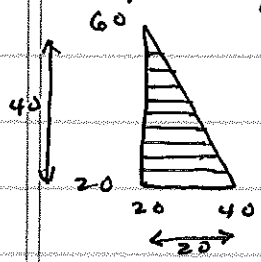
π_{MAX} occurs where $MR = MC$:

$100 - 4Q = 20$

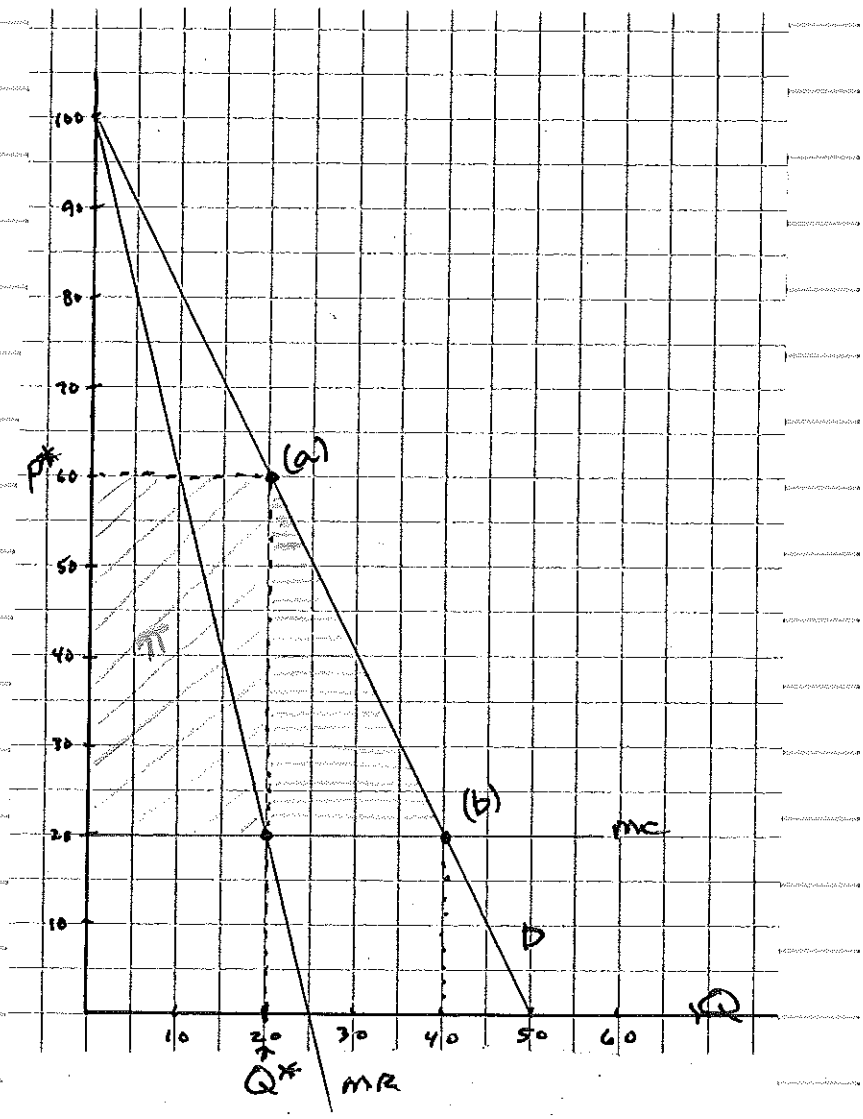
$Q^* = 20$, $P^* = 60$

$\pi = TR - TC = 60 \cdot 20 - 20 \cdot 20 = \$800$

(b) competitive outcome: $P = MC$, so $P_{comp} = \$20$ and $Q_{comp} = 40$. Deadweight loss due to monopoly restriction of output equals:



$\frac{1}{2}(20)(40) = \$400$



(c) Society is still better off with a monopoly supplying the new drug than it would be if the drug were never invented. Patent rights incentivize invention.

4. When a $5 per dose tax is levied, the firm's effective marginal cost increases by $5.

So, profit maximization requires:

$$MR = mc + tax$$

$$100 - 4Q = 20 + 5$$

$$4Q = 75, \text{ so } Q^* = 18.75$$

and $P^* = \$62.50$

$$\Pi = (62.5)(18.75) - (25)(18.75) = \$703.12$$

$$\text{deadweight loss} = \frac{1}{2}(37.5)(18.75) = \$351.56$$